

WHAT IS CLAIMED IS:

1           1.       A method for processing a partially fabricated semiconductor wafer having a layer  
2       of resistor material patterned to form a resistor on a surface of the wafer, the method comprising:

3                   (a)     performing a wet pre-metallization cleaning step on the surface of the  
4       wafer;

5                   (b )    performing an RF plasma sputter etching process on the surface of the  
6       wafer in a first reactor;

7                   (c)     advancing the wafer from the first reactor into a second reactor while  
8       maintaining unbroken vacuum conditions in the first and second reactors;

9                   (d )    depositing a layer of metal on the surface of the wafer in the second  
10      reactor;

11                  (e)     patterning the metal to form a predetermined metal interconnection  
12      pattern thereof;

13                  (f)     performing a stabilization bake cycle on the wafer, measuring the TCR of  
14      the resistor material, and rejecting the wafer if the measured TCR is greater than a predetermined

15 value; and

16 (g) completing fabrication of the wafer.

1 2. The method of claim 1 wherein the resistor material is composed of nichrome.

1 3. The method of claim 2 wherein step (b) is performed by passing argon gas into the  
2 first reactor with the wafer therein and producing an argon plasma in the first reactor adjacent to  
3 the surface of the wafer, and the applying an RF signal to the wafer to cause argon ions to  
4 impinge on the surface of the wafer and remove contaminant material therefrom.

1 4. The method of claim 2 including performing step (b) with the wafer at a  
2 temperature of approximately 400 degrees Centigrade.

1           5.     The method of claim 3 including performing step (b) while applying an RF signal  
2 of approximately 100 volts and having a frequency of approximately 13.5 MHz to the wafer to  
3 cause it to attract the argon ions.

1           6.     The method of claim 5 including performing step (b) for approximately 15-30  
2 seconds.

1           7.     The method of claim 3 wherein step (b) includes providing an argon plasma by  
2 means of an inductive coil wound around a reaction chamber of the first reactor by applying a  
3 medium frequency power signal across the inductive coil.

1           8.     The method of claim 7 wherein the frequency of the medium frequency power  
2 signal is approximately 100 kHz.

1           9.     The method of claim 8 including passing argon gas into the first reactor at a rate  
2 of approximately 25 standard cc per minute.

1           10.    A method for processing a partially fabricated semiconductor wafer having a layer  
2 of nichrome resistor material patterned to form a plurality of resistors on a surface of the wafer,  
3 the method comprising:

4                   (a)     performing a wet pre-metallization cleaning step on the surface of the  
5 wafer in a first reactor;

6                   (b )    passing argon gas into the first reactor with the wafer therein and  
7 producing an argon plasma in the first reactor adjacent to the surface of the wafer by applying a  
8 power signal having a frequency of approximately 100 kHz to an inductive coil wound around a  
9 reaction chamber of the first reactor and the applying an RF signal having a voltage of  
10 approximately 100 volts and a frequency of approximately 13.5 MHz to the wafer for  
11 approximately 15-30 seconds to cause argon ions to impinge on the surface of the wafer and  
12 remove contaminant material therefrom;

13                   (c)     advancing the wafer from the first reactor into a second reactor while  
14 maintaining unbroken vacuum conditions in the first and second reactors;

15                   (d)     depositing a layer of metal on the surface of the wafer in the second  
16     reactor;

17                   (e)     patterning the metal to form a predetermined metal interconnection  
18     pattern thereof;

19                   (f)     performing a stabilization bake cycle on the wafer, measuring the TCR of  
20     the nichrome resistor material, and rejecting the wafer if the measured TCR is greater than a  
21     predetermined value; and

22                   (g)     completing fabrication of the wafer.

1           11.     The method of claim 10 including performing step (b) with the wafer at a  
2     temperature of approximately 400 degrees Centigrade.

1           12.     The method of claim 11 including passing the argon gas into the first reactor at a  
2     rate of approximately 25 standard cubic centimeters per minute.

1           13.    A multiple-reactor system for processing a partially fabricated semiconductor  
2 wafer having a layer of resistor material patterned to form a plurality of nichrome resistors on a  
3 surface of the wafer, comprising:

4                   (a)    a first reactor for performing an RF plasma sputter etching process on the  
5 surface of the wafer;

6                   (b)    means in the multi-reactor system for advancing the wafer from the first  
7 reactor into a second reactor while maintaining unbroken vacuum conditions in the first and  
8 second reactors; and

9                   (c)    means in the second reactor for depositing a layer of metal on the surface  
10 of the wafer.

1           14.    The multiple-reactor system of claim 13 including means for passing argon gas  
2 into the first reactor with the wafer therein, and means for producing an inductively coupled  
3 plasma of argon ions in first reactor adjacent to the surface of the wafer.

1           15.    The multiple-reactor system of claim 14 including means for applying an RF  
2    signal to the wafer to cause it to attract argon ions from the plasma to close argon plans to pinch  
3    on the surface of the wafer and remove contaminant material therefrom.

1           16.    The multiple-reactor system of claim 15 including means for maintaining the  
2    wafer at approximately 400 degrees Centigrade.

1           17.    The multiple-reactor system of claim 15 wherein the means for producing an  
2    argon plasma includes an inductive coil and conductors for applying power at a frequency of  
3    approximately 100 kHz to the inductive coil.

1           18.    The multiple-reactor system of claim 17 wherein the RF signal has a voltage of  
2    approximately 100 volts and a frequency of approximately 13.5 MHz.